

R/V MUDPUPPY - SITE SAFETY PLAN for BASF North Works, Wyandotte, MI

This plan must be completed, signed and dated prior to engaging in field activities.

Project Site Location: BASF North Works, Wyandotte, MI
Project Leads: Juan Thomas, U.S. EPA; Gary Cygan, U.S. EPA
Chief Scientist: Juan Thomas, U.S. EPA; Gary Cygan, U.S. EPA
Preparation Date: October 22, 2010
Expiration Date: November 7, 2010

REVIEWED/APPROVED BY:

U.S. EPA Region 5 Health & Safety Manager

(Signature and Date) - **IF NECESSARY**

GLNPO Health & Safety Representative/Consultant

(Signature and Date) - **IF NECESSARY**

GLNPO Management Team Advisor

(Signature and Date) - **IF NECESSARY**

GLNPO Health and Safety Team Leader

L. Blum 10/22/2010
(Signature and Date)

NO further
signatures
NECESSARY

GLNPO Sediment Team Leader

Scott Cameron 10/22/2010
(Signature and Date)

GLNPO Chief Scientist

[Signature] 10/22/2010
(Signature and Date)

1.0 PURPOSE

In accordance with OSHA 29 CFR 1910.120 and EPA policy, a Site Specific Safety Plan must be completed prior to engaging in sampling activities of sites where hazardous constituents are present or when the potential for hazardous constituents exist. The plan is designed to identify, evaluate, and control safety and health hazards and provide for emergency response. To ensure that proper health and safety measures are implemented during sampling activities on board the R/V *Mudpuppy*, all onsite personnel are required to adhere to the contents of this document as well as all applicable health and safety requirements implemented by the Great Lakes National Program Office (GLNPO).

2.0 APPLICABILITY

The provisions of the plan are mandatory for all on-site personnel. This plan has been developed under U. S. EPA guidelines and complies with applicable regulations, including Occupational Safety and Health Administration (OSHA) standards [29 Code of Federal Regulations (CFR) 1910 and 1926].

U. S. EPA-GLNPO will require that all on-site personnel follow the health and safety requirements listed below:

- Employees must have appropriate training [i.e. either 40-hour or 24-hour OSHA required (29 CFR 1910.120) health and safety course for hazardous waste workers, or certified equivalent training; plus applicable 8-hour refresher training].
- Personnel working at hazardous waste sites must have had an annual physical (or physician's waiver for biennial physical) and be certified "fit for duty" and "fit for respirator use," if necessary, by a qualified physician.
- Proof of training and physical must be obtained before site work may begin (i.e. self-certification form).
- Personnel must have appropriate personal protective equipment for the specific job (i.e. hard hat, safety shoes, respirator, hearing protection, gloves, etc.)
- All equipment and field operations must meet applicable safety standards and satisfy an inspection by GLNPO Chief Scientist or his/her designee. Unsafe equipment or operations will necessitate shut down of the job.

3.0 SITE DESCRIPTION, OBJECTIVE, AND CHARACTERIZATION

Prior to field activities, this document must be completed and submitted to the appropriate Health and Safety Representatives. Based on the site characterization and analysis, it shall be determined to what extent this plan will be detailed. Sites with the potential to pose acute hazards (high hazard ranking) shall be submitted to the Regional Health & Safety Manager for approval within twenty days (or as soon as possible) prior to sampling activities. Sites with

moderate to low hazard ranking may be submitted to the GLNPO Safety Consultant for review. Completed plans of high ranking and moderate hazards must be signed/approved by appropriate personnel prior to field activities.

Date of Activities: October 25 – 29, 2010

Site Location: Trenton Channel /Detroit River, Wyandotte, ~~M~~ Michigan

Objective: (describe actions and tasks to be accomplished; i.e. identify contaminated sediments, sampling methods)

The BASF North Works property is located at 1609 Biddle Avenue in Wyandotte, Michigan. Presently, a variety of products are manufactured at the site and the property has been utilized for various manufacturing purposes for more than century. Historical contamination consisting of Distillation Blow-Off (DBO) exists both on land and in the approximate 0.5 mile stretch of the Detroit River immediately adjacent to the southern half of the site and extends into the river about 250 feet. Recently, the EPA required BASF to take pH samples from these DBO sediments. However, due to collection and analytical issues, the pH data from this sampling effort are circumspect and cannot definitively be assessed. In 2009, TechLaw collected sediment toxicity samples at upstream reference locations and at locations adjacent to the BASF facility. The results of the 10-day sediment toxicity tests indicated all eight study area sediment samples represented unacceptable risk to the benthic invertebrate community. Based on these results, EPA plans to investigate the sediment pH further, and collect pore water samples for chemical analysis to evaluate if pH and chemical data correlate with the toxicity results. EPA through its contractor, TechLaw, will collect approximately 81 pore water samples at varying depths for field testing. Water quality parameters (i.e., pH, specific conductivity, and total dissolved solids) will be analyzed in the field.

In addition to the collection of field parameters, TechLaw will collect 20 pore water samples to be analyzed by a laboratory for metals, chloride, sulfate, and alkalinity. Analysis of alkalinity will be used to determine carbonate concentrations. For samples collected from approximately 0 to 0.5 feet below ground surface (bgs), a Harpoon sampling device will be utilized. The Harpoon sampler is a new method for obtaining shallow depth pore water samples. It involves the insertion of a small diameter drive tip (0.25-inch outside diameter [OD]) with a 0.5 inch-long sampling screen approximately 15 cm (6 inches) into the riverbed by hand or using a small hammer and a temporary and detachable (0.5-inch inside diameter [ID]) drive rod. Once the tip is inserted, the drive rod is detached and the drive tip is left in place with a 1/16-inch ID, flexible polyethylene sampling tube attached to it along with a 0.25 inch-OD stainless steel retrieval cable. The method has the advantage that the boat need not stay completely still during sampling (depending on the amount of extra tubing attached) and no heavy drive rods are needed or have to be held still in the water column during sampling. The flexible tubing and retrieval cable should allow some small lateral movement of the boat without pulling the sample probe out of the sediments. The Harpoon sampler is the preferred device for this shallow interval since the water depths may be up to 30 feet deep, and the lines attached to the Harpoon sampler are flexible. The flexible lines allow for more representative samples to be collected since the position of sampling device is less likely to shift around due to currents in the Detroit River.

A peristaltic pump and sampling manifold will be used to collect water samples. Because of the shallow insertion depth (0.15 m), the total volume of water pumped from the Harpoon Sampler should not exceed 400 milliliters (mL) to avoid pulling overlying surface water into the pore water sample. At greater depths, (i.e., > 0.30 m) larger amounts of water can be pumped (up to several liters); however, the time required to obtain those samples would be prohibitively long due to the small diameter tubing used and slow pumping rate. For pore water samples deeper than 0.5 feet bgs, a Waterloo profiler sampling device will be utilized. The Waterloo profiler is a direct push method that will be used to obtain pore water samples from the sediment of the Detroit River.

The Waterloo Profiler involves driving a 1.25-inch OD sampling port into the subsurface deposits using a percussion hammer to a depth of one foot (depending on the stability of the boat). The profiler uses stainless steel tubing, a peristaltic pump, and sampling manifold to collect water samples. The sample port can be then driven to greater depths (several feet) to collect deeper samples as necessary. Due to concerns of pulling overlying surface water into the sample water in shallow depths, the Waterloo profiler will be used at depths of one foot or greater.

Material Types: Liquid: ☒ Solid: ☐ Sludge: ☐ Gas: ☐ Sediment: possible

Characteristics: Corrosive: ☒ Ignitable: ☐ Radioactive: ☐ Volatile: ☒
Toxic: ☒ Reactive: ☐ Unknown: ☐

Unusual Site Features (i.e. known or potential hazards):

There is a swift current in the federal navigation channel and there is a lot of boat traffic along the Trenton Channel, so caution will be taken when motoring around the site and when anchoring.

Status:

Background Review: Completed: ☒ Preliminary: ☐ Incomplete: ☐

Additional Information:

4.0 ONSITE ORGANIZATION & COORDINATION

| <u>Role</u> | <u>Name, Organization</u> | <u>Self-Certification Form on file?</u> |
|---------------------------|---|---|
| Project Leads: | Juan Thomas, U.S. EPA LCD | Yes |
| | Gary Cygan, U.S. EPA LCD | Yes |
| Chief Scientists: | same as Project Leads | |
| Site Safety Officers: | same as Chief Scientists | |
| Other Field Team Members: | Joe Bonem, Cetacean Marine | Yes |
| | Jon Wagar, Cetacean Marine | Yes |
| | Kimberly Whitlock, TechLaw, Inc. (LCD Contractor) | |
| | Dr. Brewster Conant Univ. of Waterloo | |
| | (Subcontractor to LCD Contractor) | |

All persons onsite must be listed above. All activities on site must be cleared with the Chief Scientist.

5.0 ONSITE CONTROL

Joe Bonem has been designated to coordinate access control and security on site. No unauthorized person should be within this area. The Mudpuppy will be docked and launched from Pier 500 Marina in Wyandotte, MI during the dates of oversight/sampling activities.

Whenever possible, sampling activities should occur downwind of the cabin area. When sampling areas where the potential exists for airborne concentrations of contaminants could exceed OSHA Permissible Exposure Limits (PELs), sampling activities must occur downwind of the cabin area.

6.0 HAZARD EVALUATION

The following substance(s) are known or suspected to be on site:

☒ PCBs ☒ Metals ☒ PAHs ☐ Pesticides ☒ Oil and Grease

Additional hazards not listed above: pH

The primary hazards associated with these substances are described in **Attachment 1** of this document.

In addition to the substances listed above, the following analytical chemicals are expected to be

brought on site (MSDSs must accompany any chemicals brought on board):

Hazardous substance information form(s) for the involved substance(s) have been completed and are attached.

Documentation/Summary (Overall Hazard):

Serious/High: ____ Moderate: X Low: ____ Unknown: ____

Brief Summary of Hazard Evaluation:

7.0 PERSONAL PROTECTIVE EQUIPMENT

Under normal operations, Level D is the minimum Personal Protective Equipment (PPE) required to be worn by personnel working on board the R/V Mudpuppy: hard hat, steel toed footwear, and personal floatation device (PFD). Modification to the level of protection should be specified in the space provided below.

Based on the evaluation of potential hazards, the following levels of personal protection have been designated for use for the applicable work tasks:

| <u>Location</u> | <u>Job Function</u> | <u>Level of Protection</u> |
|-----------------------|-----------------------------|----------------------------|
| Forward or after deck | sampling | Level D + latex gloves |
| | sample handling | Level D + latex gloves |
| | anchoring | Level D |
| Inside cabin | boat positioning, oversight | Level D |

If sediment samples are collected, then sampling personnel should step up to Modified Level D.

* Note: Modified Level D protection includes: hard hat with face shield, steel toed footwear, Tyvek® coveralls, boot covers (if boots are not chemically-protected), Personal Floatation Device, and double gloves. Modified Level D indicates that no respiratory protection is normally required.

Full-face respirators of the proper size and equipped with the appropriate cartridges/canisters (for VOCs) should be available if the environmental monitoring (PID) indicates a threat to human health. The Chief Scientist will be responsible for initiating the step to full Level C protection.

This survey will require PPE suitable for normal operating conditions as described above.

8.0 ONSITE WORK PLAN

(Include all tasks to be performed, persons or agency performing tasks, and necessary precautions to be implemented while performing tasks)

Under usual circumstances the following tasks are performed on board the R/V *Mudpuppy*:

- Sediment collection using the vibracore/ponar/box corer, etc. – Ponar or Eckman grab, if used, will be conducted by the *Mudpuppy* Field Crew
- Sediment processing - conducted by the *Mudpuppy* Field Crew
- Packaging of sediment samples for transportation – TechLaw
- Boat positioning and anchoring - conducted by the *Mudpuppy* Field Crew

The following additional activities will be conducted on board (specify tasks and personnel performing tasks):

9.0 COMMUNICATION PROCEDURES

Channel 16 has been designated as the radio frequency for emergency communication.

Five (5) short horn blasts is the emergency signal to indicate that all personnel should leave the sampling area.

The following hand signals should be used in the absence of verbal communication:

Hand gripping throat = out of air, can't breathe.
Hands on top of head = need assistance
Thumbs up = OK, I'm all right, I understand
Thumbs down = No, Negative

10.0 DECONTAMINATION PROCEDURES

Personnel and equipment leaving the sampling area (Exclusion Zone) shall be thoroughly decontaminated. The standard decontamination protocol on board the R/V *Mudpuppy* is as follows:

- Decontamination is conducted in Modified Level D PPE.
- Water is used as a decontamination solution using a garden hose.

- Avoid direct inhalation when spraying hose during decontamination procedures.
- Proper doffing procedures shall be implemented following decontamination (i.e. latex gloves are removed last).

If other decontamination procedures are required, please list equipment required and procedure(s) implemented (i.e. brushes, solutions, etc.):

11.0 SITE SAFETY & HEALTH PLAN

The designated Site Safety Officer (typically the Chief Scientist) is directly responsible for the safety recommendations on site.

Emergency Medical

The R/V Mudpuppy Captain and Marine Technician are certified by the American Red Cross in “Standard First Aid” and “CPR/AED – Adult and Child with CPR – Infant.” The R/V Mudpuppy crew can be reached via cell phone at 312-961-0592.

Henry Ford Wyandotte Hospital; 2333 Biddle Ave., Wyandotte, MI 48192; 734-246-6000

(See map and directions in Attachment 2.)

First aid/safety equipment is available as follows:

- Emergency eye wash is located inside the cabin area
- First aid kit is located inside the cabin area
- PFDs are located inside cabin area
- Ring buoys are located forward and aft
- Fire extinguishers throughout vessel

Emergency medical information for substances present or suspected to be present:

| <u>Substance</u> | <u>Exposure symptoms</u> | <u>First Aid Instructions</u> |
|------------------|--------------------------|-------------------------------|
|------------------|--------------------------|-------------------------------|

See Attachment 1 for this information

Any person who becomes ill or injured on board the R/V *Mudpuppy* must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed, and first aid administered prior to leaving the R/V *Mudpuppy*. If the condition is serious, at least partial decontamination should be completed.

Environmental Monitoring

The following environmental monitoring equipment shall be used on site at specified intervals:

PID/FID – deployed in the breathing zone while homogenizing samples, only if sediment samples are collected.

Combustible Gas Indicator - continuously/hourly/daily/other _____

O2 Monitor - continuous/hourly/daily/other _____

Colorimetric tubes (type) _____ continuously/hourly/daily/other _____

HNU/OVA - continuously/hourly/daily/other _____

Geiger Counter - continuously/hourly/daily/other _____

Other _____ (specify)- continuously/hourly/daily/other _____

A PID meter will be used to monitor for volatile organic compounds and other hazardous conditions during sediment sampling activities aboard the *Mudpuppy*. The PID should be placed and operated on-deck during all sampling activities, as close to the breathing zone as practical. PID readings should be observed previous to the initiation of sampling activities, then at regular intervals during sampling and processing of samples. If VOC readings are observed to deviate five (5) ppm above background conditions for a sustained period (i.e. greater than 30 seconds), respirators must be donned by those working on deck. In addition, the PID is equipped with preset alarm levels which are set at concentrations protective of the time-weighted average (TWA) regulations prescribed by OSHA. If, at any time, the alarm on the PID sounds, respirators should be donned immediately and the source of the alarm should be investigated. Appropriate measures, as directed by the Site Safety Officer, should be taken to alleviate or remedy the cause of the elevated source(s).

Emergency Procedures

The Site Safety Officer shall be notified of any on site emergencies and be responsible for ensuring that appropriate procedures are followed.

PPE Failure

If a site worker experiences personal protective equipment failure they shall immediately leave the area and not re-enter until equipment has been repaired or replaced.

Other Equipment Failure

If equipment on site fails to operate properly, the Site Safety Officer shall be notified and then determine the effect of this failure on continuing operations.

Medical Monitoring

Personnel may be exposed to either hot or cold environments while sampling, therefore the Captain and Site Safety Officer must be aware of the signs and symptoms of hypothermia and heat stroke. If at any time conditions are such that they lead to impaired judgment or performance, the Captain or Site Safety Officer may choose to alter working hours or deem conditions unsafe for work activities and stop sampling. Heat stress monitoring is required if air

temperature is over 70 degrees F; physiologic monitoring procedures include monitoring body temperature, pulse, and fluid intake.

The expected air temperature will be 50 - 65 degrees F.

12.0 SITE SPECIFIC ORIENTATION

This is to certify that all on-site personnel have read the above plan and are familiar with its provisions.

The field crew was briefed on the contents of this plan on _____.

Chief Scientist: Juan Thomas (sign)_____

Chief Scientist: Gary Cygan (sign)_____

Captain: Joe Bonem (sign)_____

Marine Tech: Jon Wagar (sign)_____

Other Personnel: Kimberly Whitlock (sign)_____

Other Personnel: (sign)_____

NOTES/DEVIATIONS FROM PLAN:

ATTACHMENT 1 - HAZARD EVALUATION

The following substance(s) are known or suspected to be on site:

Arsenic, Cadmium, Chromium, Lead, Mercury, Nickel, Zinc, PCBs, PAHs.

The primary hazards associated with these substances are as follows:

Arsenic - oxidizes rapidly when exposed to atmosphere. Oxidation products of arsenic are more toxic. Oxidation product Arsine - extreme acute toxicity can occur within a few hours at concentrations of 3-10 ppm. Other systemic effects include: poisonous by inhalation and ingestion, human carcinogen, irritation of digestive tract, decrease in production of red and white blood cells, abnormal heart function, blood vessel damage, liver and/or kidney damage, and impaired nerve function. There are also latent symptoms associated with exposure to arsine. These symptoms include: headache, dizziness, garlic odor of breath, numbness, chills and tingling of hands and feet, nausea, vomiting, abdominal cramping, abdominal tenderness and rigidity, bronzing of the skin, pulmonary edema, jaundice. The OSHA PEL/TWA for Arsine is 0.05ppm (0.2 mg/m³).

Cadmium - Human carcinogen, inhalation hazard; pulmonary edema, ingestion hazard; coughing tightness of chest, headache, chills, muscular ache, insomnia, emphysema, nausea, vomiting, diarrhea, mild edema. The OSHA PEL/TWA for Cadmium is 0.2 mg/m³ with a ceiling concentration limit of 0.6 mg/m³ for dusts and 0.1 mg/m³ with a ceiling concentration limit of 0.3 mg/m³ for fumes.

Chromium - Potential human carcinogen, effects lungs, respiratory system, and skin, irritant to mucous membranes, can cause ulcerations of nares and respiratory tract. The OSHA PEL/TWA for Chromium is 1 mg/m³.

Lead - Inhalation, contact and ingestion hazard; weakness, insomnia, abdominal pain anemia, tumors hypotension, etc. Target organs include the GI tract, Central nervous system, kidneys, and tissue. The OSHA PEL/TWA is 0.100 mg/m³ (air concentrations must be maintained at a level by which blood lead level remain <0.080 mg/100g of whole blood [OSHA 1910.1025]).

Mercury - Inhalation, absorption, ingestion and contact hazard; causing dizziness, blurred vision, emotional disturbance, diarrhea, nausea, vomiting, skin burns, etc. Target organs include the Central nervous system, kidneys, eyes, and skin. The OSHA PEL/TWA for Mercury compounds is 0.01 mg/m³.

Nickel - NIOSH has identified Nickel as an occupational human carcinogen. Hazards: Inhalation, ingestion, and contact hazard. Target organs include lungs, paranasal sinus, and CNS. Signs and symptoms of exposure include: head ache, vertigo, nausea, vomiting, epigastric pain, cough, weakness, pneumitis, delirium, convulsions. The OSHA PEL/TWA for Nickel is 0.1 mg/m³ for soluble compounds and 1 mg/m³ for metals and insoluble compounds.

Zinc - Can effect the respiratory system, skin, and eyes. Symptoms of exposure include: dry mouth, coughing, conjunctivitis, chills, tightness of chest, headache, cramps, blurred vision, low back pain, vomiting, etc. OSHA PEL/TWA varies dependent upon the specific zinc compound. The PEL for Zinc oxide fumes is 5 mg/m^3 .

PCBs - Inhalation, absorption, contact, and ingestion hazard. Irritant to the eyes and skin; dermal carcinogen. Target organs - skin, eyes, and liver. The OSHA PEL/TWA for PCBs is 0.5 mg/m^3 for skin. NIOSH has established an REL of 0.001 mg/m^3 .

PAHs - (Polynuclear Aromatic Hydrocarbons) Inhalation, absorption, ingestion, and contact hazard. Target organs - blood, CNS, skin, bone marrow, eyes, kidney, liver, and respiratory system. Signs and symptoms of exposure include but are not limited to irritation to the mucous membrane, head ache, dizziness, staggering, fatigue, depression, dermatitis, etc. The OSHA PEL/TWA for PAHs varies with the chemical composition; check appropriate references for specific PELs.

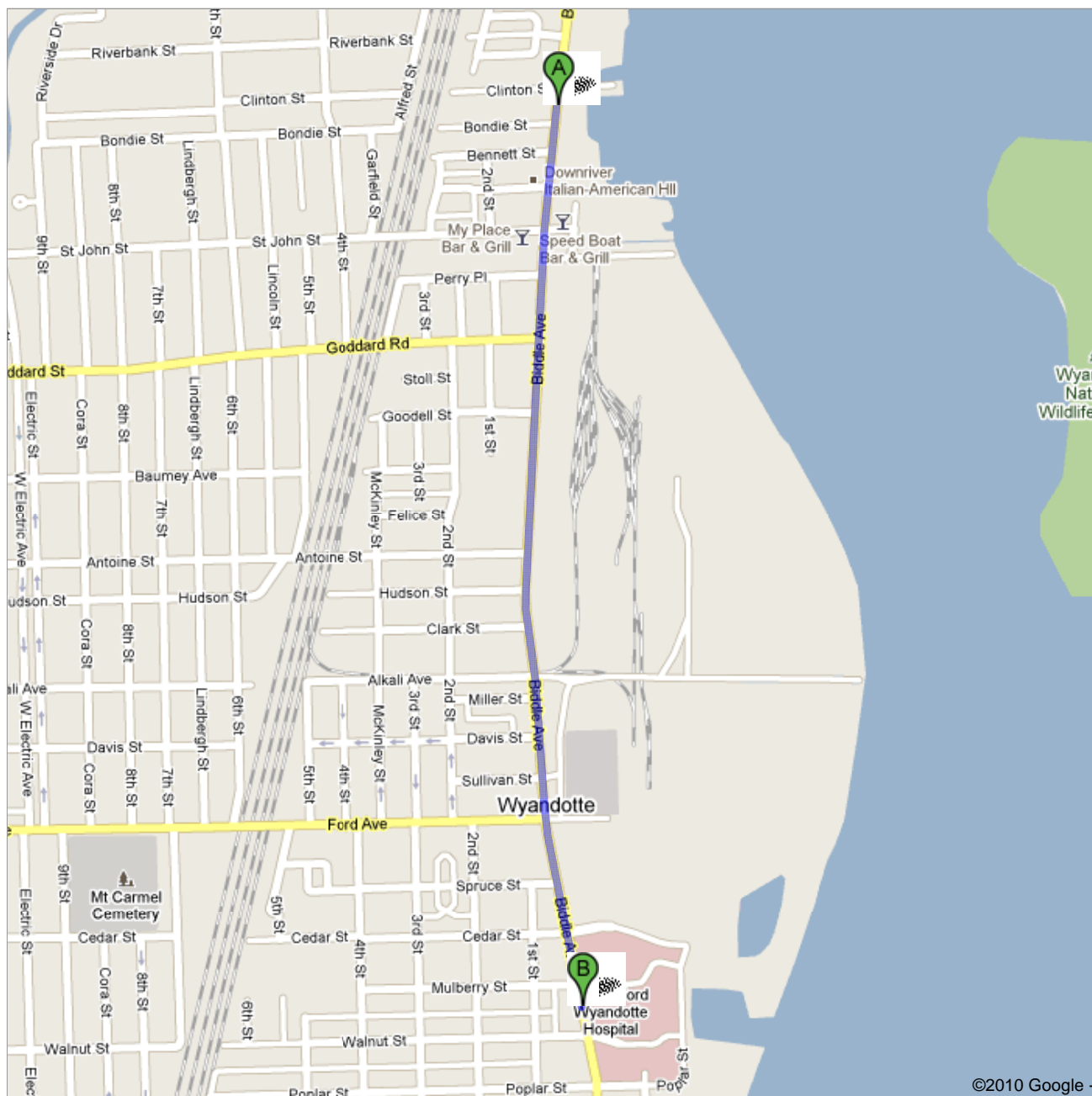
pH - pH is a measure of how acidic/basic water is. The range goes from 0 - 14, with 7 being neutral. pHs of less than 7 indicates acidity, whereas a pH of greater than 7 indicates a base. Chemicals that are very basic or very acidic are called "reactive." These chemicals can cause severe burns. pH levels over 12.5 are considered "corrosive" and a hazardous waste. Sediments have shown high pH levels. Skin is the target organ and absorption is the route of exposure for too acidic or basic pH exposures. PPE to protect against pH in sediment exposure are gloves.




Directions to Henry Ford Wyandotte Hospital
2333 Biddle ave, Wyandotte, MI 48192 - (734) 246-6000
1.3 mi – about 2 mins

Save trees. Go green!


Download Google Maps on your phone at google.com/gmm



 Pier 500 Marina
525 Biddle Ave, Wyandotte, MI 48192

-
1. Head **south** on **Biddle Ave** toward **Bondie St**
Destination will be on the left
About 3 mins

go 1.3 mi
total 1.3 mi

 Henry Ford Wyandotte Hospital
2333 Biddle ave, Wyandotte, MI 48192 - (734) 246-6000

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2010 Google

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